Amendments to the Claims

Please cancel claims 2-3, 9-10, 15-28 and 32-51, amend claims 1, 4-8, 11-14 and 29-31, and add new claims 52-71, in accordance with the following listing of claims.

1. (Currently Amended) A satellite communication system comprising:

a terrestrial base station; and

a first satellite communicating with said terrestrial base station using ~~a infrared signal~~ an infrared signal,

wherein said first satellite is configured in an inclined elliptical orbit having an apogee at or near zenith for said terrestrial base station,

wherein an optimal location of said terrestrial base station for said communicating is determined based on a wavelength of said infrared signal and an attenuation of said infrared signal between said terrestrial base station and said first satellite at said wavelength, and

wherein said attenuation is determined based on a cloud water content for communication at zenith, persisting in a region in which said terrestrial base station is located.

2-3. (Canceled)

4. (Currently Amended) The satellite communication system of claim ~~3~~ 1, wherein said optimal location of said terrestrial base station is defined by longitude and latitude.

5. (Currently Amended) The satellite communication system of claim ~~3~~ 4, wherein said cloud water content is determined at the longitude and latitude of said terrestrial base station based on an exceedance probability.

6. (Currently Amended) The satellite communication system of claim ~~3~~ 4, wherein said cloud water content is determined at the longitude and latitude of said terrestrial base station based on a cloud water content formula.

7. (Currently Amended) The satellite communication system of claim ~~3~~ 1, wherein said attenuation is determined based on ~~the~~ a probability density function of an elevation angle to said first satellite from said terrestrial base station.

8. (Currently Amended) ~~The~~ A satellite communication system ~~of claim 1, further~~ comprising:

a terrestrial base station; and

a constellation of satellites each communicating directly with said terrestrial base station using an infrared signal, said constellation comprising at least a first satellite, a second satellite, a third satellite, a forth satellite and a fifth satellite, said first satellite, said second satellite and said third satellite each being in a phased Molniya orbit, and said fourth satellite and said fifth satellite each being in a geosynchronous orbit,

wherein an optimal location of said terrestrial base station for said communicating is determined based on a wavelength of said infrared signal and an attenuation of said infrared signal between said terrestrial base station and said first satellite at said wavelength, and

wherein said attenuation is determined based on a cloud water content for communication at zenith, persisting in a region in which said terrestrial base station is located.

9-10. (Canceled)

11. (Currently Amended) The satellite communication system of claim ~~10~~ 8, wherein said optimal location of said terrestrial base station is defined by longitude and latitude.

12. (Currently Amended) The satellite communication system of claim ~~10~~ 11, wherein said cloud water content is determined at the longitude and latitude of said terrestrial base station based on an exceedance probability.

13. (Currently Amended) The satellite communication system of claim ~~10~~ 11, wherein said cloud water content is determined at the longitude and latitude of said terrestrial base station based on a cloud water content formula.

14. (Currently Amended) The satellite communication system of claim ~~10~~ 8, wherein said attenuation is determined based on ~~the~~ a probability density function of an elevation angle to said constellation of satellites from said terrestrial base station.

15-28. (Canceled)

29. (Currently Amended) A method for determining an optimal location for ~~transmitting an infrared signal between~~ a terrestrial base station communicating with ~~and~~ a satellite using an infrared signal, said method comprising the steps of:

determining a ~~first~~ cloud water content for communication at zenith, persistent at ~~a first location in a region~~ each of a plurality of locations;

determining an ~~a first~~ attenuation of said infrared signal at each of said plurality of locations based on said ~~first~~ cloud water content and on a probability density function of an elevation angle to said satellite from said locations;

~~determining a second cloud water content at a second location in said region;~~

~~determining a second attenuation of said infrared signal based on said second cloud water content;~~

determining ~~the lesser of said first attenuation and said second~~ which one of the plurality of locations has the least attenuation; and

selecting ~~one of said first location and said second location~~ as an optimum location, ~~said first location being selected if said first attention is less than said second attenuation, said second location being selected if said second attention is less than said first~~ the one location having the least attenuation.

30. (Currently Amended) The method of claim 29, wherein the step of determining said ~~first~~ cloud water content at each of said plurality of locations is based on an exceedance probability.

31. (Currently Amended) The method of claim ~~29~~ 30, wherein said step of determining said ~~second~~ cloud water content at each of said plurality of locations is based on ~~an exceedance~~

~~probability~~ <u>a cloud water content formula which expresses cloud water content as a function of said exceedance probability and location latitude and longitude</u>.

32-51. (Canceled)

52. (New) The satellite communication system of claim 1, wherein said communicating occurs only when said first satellite is in a portion of said elliptical orbit which is at or near the apogee.

53. (New) The satellite communication system of claim 1, wherein said elliptical orbit is inclined at critical inclination.

54. (New) the satellite communications system of claim 1, wherein the wavelength of said infrared signal is about 10 microns.

55. (New) The satellite communication system of claim 8, wherein said communicating with the first, second and third satellites occurs only when each of said first, second and third satellites is in a portion of said Molniya orbit which is at or near apogee.

56. (New) The satellite communication system of claim 8, wherein said Molniya orbit is inclined at critical inclination.

57. (New) The satellite communications system of claim 8, wherein the wavelength of said infrared signal is about 10 microns.

58. (New) The method of claim 29, wherein said infrared signal has a wavelength of about 10 microns.

59. (New) A satellite communication system comprising:

a first terrestrial base station located in a selected region;

a second terrestrial base station located in said selected region at a specified distance from said first terrestrial base station; and

a satellite adapted to communicate with said first terrestrial base station using a first infrared signal and with said second terrestrial base station using a second infrared signal,

wherein said satellite is configured in an inclined elliptical orbit having an apogee at or near zenith for said first and second terrestrial base stations,

wherein said selected region is selected to minimize attenuation of said first and second infrared signals between said terrestrial base stations and said satellite, said attention being based on cloud water content persistent in said selected region for communication at zenith, and

wherein communication with said satellite is switched between said first terrestrial base station and said second terrestrial base station so as achieve at any time the greatest communication link performance.

60. (New) The satellite communication system of claim 59, wherein said communication occurs only when said satellite is in a portion of said elliptical orbit which is at or near the apogee.

61. (New) The satellite communication system of claim 59, wherein said elliptical orbit is inclined at critical inclination.

62. (New) the satellite communications system of claim 59, wherein each of said first and second infrared signals has a wavelength of about 10 microns.

63. (New) The satellite communications system of claim 59, wherein said cloud water content in said selected region is determined based on a cloud water content formula which expresses cloud water content as a function of an exceedance probability and said selected region's latitude and longitude.

64. (New) A satellite communication system comprising:

a terrestrial base station located in a selected region;

a first satellite adapted to communicate with said terrestrial base station using a first infrared signal; and

a second satellite adapted to communicate with said terrestrial base station using a second infrared signal,

wherein said first and second satellite are configured in an inclined elliptical orbit having an apogee at or near zenith for said terrestrial base station, and are phased so as to be able to communicate with said terrestrial bas station simultaneously,

wherein said selected region is selected to minimize attenuation of said first and second infrared signals between said terrestrial base station and said first and second satellites, said attention being based on cloud water content persistent in said selected region for communication at zenith, and

wherein communication with said terrestrial base station is switched between said first satellite and said second satellite so as achieve at any time the greatest communication link performance.

65. (New) The satellite communication system of claim 64, wherein said communication occurs only when said first and second satellites are in a portion of said elliptical orbit which is at or near the apogee.

66. (New) The satellite communication system of claim 64, wherein said elliptical orbit is inclined at critical inclination.

67. (New) The satellite communications system of claim 64, wherein the wavelength of said infrared signals is about 10 microns.

68. (New) The satellite communications system of claim 64, wherein said cloud water content in said selected region is determined based on a cloud water content formula which expresses cloud water content as a function of an exceedance probability and said selected region's latitude and longitude.

69. (New) An air-ground communication system comprising:

a terrestrial base station located in a selected region; and

an aircraft adapted to communicate with said terrestrial base station using an infrared signal,

wherein said aircraft flies at high altitude in a closed path so as to be able to communicate continuously with said terrestrial base station at or near zenith,

wherein said selected region is selected to minimize attenuation of said infrared signal between said terrestrial base station and said aircraft, said attention being based on cloud water content persistent in said selected region for communication at zenith.

70. (New) The air-ground communications system of claim 69, wherein the wavelength of said infrared signal is about 10 microns.

71. (New) The air-ground communications system of claim 69, wherein said cloud water content in said selected region is determined based on a cloud water content formula which expresses cloud water content as a function of an exceedance probability and said selected region's latitude and longitude.